Space Weather Forecast

Issued on Monday, 03 April 2023 at 13:19 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Minor Geomagnetic Storms Days 1-3. Slight chance of Moderate class flares (R1-R2; Minor-Moderate radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with several small Common-class flares observed towards the end of the day (2 Apr). There are currently four sunspot regions on the visible disc. Most are small and simple with little magnetic complexity. However, the newly emerged sunspot region in the southern hemisphere near the centre disc continues to grow and contains the greatest potential for notable flaring. No significant Coronal Mass Ejections (CMEs) are forecast to be Earth-directed, with glancing blows more probable.

Solar Wind / Geomagnetic Activity: The solar wind started the period at Elevated levels between around 530 km/s due to the ongoing enhancement of a fast stream from a coronal hole. This effect is waning with solar winds now Slightly Elevated (around 490km/s). The important north-south component has been weakly fluctuating. Geomagnetic activity has been at Quiet to Unsettled (Kp1-3) levels.

Energetic Particles / Solar Radiation: High energy proton enhancement (greater than 10MeV) has been at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to continue at Low levels over the four-day period, with a daily Slight Chance of becoming Moderate.

Solar Wind / Geomagnetic Activity: Although no significant Earth-directed CMEs are forecast, there is a slight chance of glancing blows from one or more CMEs at Earth on Days 1 and 2 (03 and 04 Apr).
Solar winds are at Slightly Elevated levels on Day 1 (03 Apr), although this may be complicated by any transitory CME impacts. On Days 2-3 (04-05 Apr) Earth is expected to connect to the high-speed stream from one or more coronal holes. Solar wind speeds are expected to return to Elevated or perhaps Strong levels and continue into Day 4 (06 Apr).

Generally Quiet to Unsettled geomagnetic activity is likely for the remainder of Day 1 with a chance of Active intervals or perhaps isolated G1/Minor Storm conditions, particularly should any CME effects occur. There is an increasing probability of Active or G1/Minor Storm intervals on Day 2 due to the combined influence of coronal hole high-speed stream and possible transitory CME effects. Activity should generally become Unsettled by Days 3 and 4 with a reducing risk of Active or G1/Minor Storm conditions in the absence of any further CMEs.

Energetic Particles / Solar Radiation: No solar radiation storms are expected through the period.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	40	20	10
Strong	G3	No	1	5	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	15	20	20	15
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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